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Patent Office  
Republic of Korea (KR)

Official Patent Bulletin (B,) No. 3591

Date of Patent Disclosure: April 6, 1994

Disclosure No.: 94-2868

Patent Application Date: April 19, 1991

Application No.: 91-6268

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( 5 pages all in all )

## Coffee-Flavored Ginseng-Containing Chewing Gum and its Manufacturing Process

### Detailed Description of the Invention

The invention relates to coffee-flavored chewing gum containing ginseng in its recipe and more precisely, to a ginseng-containing coffee-flavored chewing gum and its manufacturing process, said chewing gum being designed to enable consumers to assimilate saponin, one of ingredients of ginseng, and enjoy coffee flavor at the same time, by addition of both ginseng and coffee ingredients to the usual gum base.

Generally speaking, ginseng is a world-renowned herb which contains an aglycone known as saponin, carbohydrates such as xylose, fructose, and glucose; amino acids, alkaloids, flavonoids, phenols, and a very small amount of vitamins. Through the combined pharmacological effect of these ingredients, ginseng is known to be efficacious in combatting symptoms or diseases such as stress, diabetes, various cancers, hypertension, fatigue, etc, and to have excellent cardiac and tonic effects (refer to the following Table 1).

Table 1. Supporting and Pharmacological Effects of Ginseng

Symptoms or diseases for which ginseng is efficacious	Pharmacological effects
Stress	Supports homeostasis and normalization
Fatigue	Increases physical stamina and extends life cycle
Hypochondria	Stimulating effect on central nervous system
Cardiac arrhythmias (irregular heartbeat)	Cardiac effect
Hypertension	BP-lowering effect
Anemia	Increases number of red blood cells and hemoglobin by improving the activity of hematogenic factors
Diabetes	Lowers the effects of blood sugar
Ulcer	Accelerates the growth of cells and tissues, stimulates the synthesis of nucleic acids
Cancer	Anticancer effect
Skin	Increases moisturization of skin, helps maintain healthy skin

In accordance with the above widely-reported fact that the ingredients of ginseng have superb pharmacological effects, applying ginseng ingredients or ginseng flavor to various kinds of favorite food products is tending to gain popularity. The ginseng ingredients are added during some chewing-gum manufacturing processes.

On the other hand, coffee flavor or coffee, a favorite food item, is also combined with various food products such as ice creams and chewing gums.

However, while consumers chew these gum as a function of personal preferences, there is a problem that they cannot enjoy two kinds of flavor from one stick of gum because the ginseng-added or coffee-flavored gums have been developed along separate lines until recently, which limits the range of choices accordingly.

The present invention is to broadly satisfy consumers' customary preferences for their favorite flavor; it aims to provide consumers with ginseng- and coffee-flavored chewing gums by adding both ingredients, ginseng and coffee, to gums, thereby enabling them to ingest saponins, the active ingredient of ginseng, and simultaneously or progressively enjoy the unique flavor of coffee as they chew the gum.

A detailed explanation of the invention is as follows;

The salient feature of this invention is the coffee-flavored chewing gum containing ginseng ingredients, which can be produced by combining the following raw materials:

- 20-22 weight % of the usual gum base, which is composed of polyvinyl alcohol (PVAc), natural or synthetic rubber, wax, emulsifiers, and inorganic filler.
- 0.26-1.20 weight % of ginseng extract.
- 0.15-0.80 weight % of ginseng powder.
- 0.4-2.0 weight % of instant coffee powder.
- 64-68 weight % of sugar.
- 8-9 weight % of millet jelly (sy. up).
- 0.4-2.0 weight % of roast(carbonated) coffee flavor or substances that combine to make coffee flavor.
- 0.01-0.12 weight % of mint flavor.
- 0.06-0.14 weight % of *l*-menthol for making menthol flavor.

A more detailed description of the invention is as follows;

The coffee-flavored chewing gum containing ginseng ingredients can be manufactured by combining the following materials: with 20-22 weight % of the usual gum base, which consists of polyvinyl alcohol, natural or synthetic rubber, wax, emulsifiers, inorganic filler.

- As the ingredients of ginseng, 0.26-1.20 weight % of ginseng extract, which can be made by the processes of filtering and concentrating with reduced pressure the raw liquid of ginseng extracts.
- 0.15-0.80 weight % of ginseng powder obtained by pulverizing ginseng roots.
- 0.4-2.0 weight % of instant coffee powder, which is made by grinding up coffee granules.
- 64-68 weight % of sugar and 8-9 weight % of millet jelly.
- 0.06-0.14 weight % of *l*-menthol for menthol flavor.
- 0.4-2.0 weight % of roast coffee flavor for a taste of coffee.
- 0-0.12 weight %, desirably 0.01-0.12 weight %, of mint flavor for improving ginseng flavor.

At this time, the object of this invention can be achieved without adding mint flavor to gum base. However, the use of mint flavor is preferable.

For the ginseng extract of the coffee-flavored ginseng chewing gum, 6 year old fresh ginseng roots are cleaned by washing and cut to a size of about 5 mm, then mixed with a 2.5-fold amount of alcohol and water as a solvent in a round-bottomed flask. A coarse extract is to be extracted under refluxing for 5 hours, then filtered and concentrated under reduced pressure to obtain the extract. At this point in time, if the ginseng extract solution contains less than 0.26 weight %

extract, the ginseng flavor will be too mild, whereas if it contains more than 1.20 weight % extract, the flavor will be impaired.

For ginseng powder, a fine selection of raw ginseng roots are chosen, cleaned by washing, dried, and pulverized to a size of 50 mesh. The addition of less than 0.15 weight % of ginseng powder to gum base is not desirable because the durability of the ginseng flavor is weakened, while the addition of more than 0.80 weight % creates a strong ginseng taste, significantly lowering the gum's fragrant flavor.

Adding ginseng extract and powder to gum base not only produces a ginseng flavor, but also has the effect of extending the durability of the ginseng flavor.

The instant coffee added with the ginseng extract and powder to the gum, is made from coffee granules. If an amount of less than 0.4 weight % instant coffee is added, the coffee flavor will not be perceived, while if more than 2.0 weight % is added, the coffee flavor will be much too strong, producing a bitter taste and ruining the flavor.

The invention also includes a manufacturing process to produce the coffee-flavored ginseng chewing gum. The manufacturing process of the inventive chewing gum is as follows: First, put 20-22 weight % of the usual gum base, 64-68 weight % of sugar, 8-9 weight % of millet jelly, 0.26-1.2 weight % of ginseng extract, 0.15-0.80 weight % of ginseng powder, 0.4-2.0 weight % of instant coffee powder, and the usual sweeteners and softeners into a mixer preheated at 60-70 degrees C and mix.

Second, while maintaining the mixture at a temperature lower than 55 degrees C, 0.4-2.0 weight % of roasted coffee flavor, 0.01-0.12 weight % of mint flavor, and 0.06-0.14 weight % of *l*-menthol are added and mixed.

In manufacturing the chewing gum according to the above-specified composition, first put gum base, sweeteners, and softeners into the mixer preheated at 60-70°C, and mix and then maintain a temperature no higher than 55°C. Finally, a gum composite is made by adding and mixing the flavor with the above mixture. For the flavors, mint flavor will be used to improve the ginseng taste itself and effectively bring out the ginseng flavor. Roasted coffee flavor and instant coffee powder for coffee flavor, and *l*-menthol for mint flavor are then added. At this time, the usual sweeteners, licorice roots, and softeners can be added in the process of manufacturing gums.

Consumers can assimilate saponins, the active substance of ginseng extract, and simultaneously enjoy the popular flavor of coffee from this coffee-flavored ginseng gum; when chewing the inventive chewing gum, they can taste a peanut-like coffee flavor at the beginning, a mixed taste of coffee flavor and mild ginseng ingredients in the middle of consumption, and a bitter taste of ginseng while the coffee flavor lingers in the latter stage of chewing. Gradually, the coffee-flavored ginseng gum of the invention reaches a steady state and has the well-known pharmacological action produced by the saponin ingredient contained in the chewing gum.

The invention is explained on the basis of some experimental studies as follows:

### Experiment 1

A chewing gum composite was made and evaluated by the following process.

1. We put 21 weight % of gum base, 68 weight % of sugar, 8.9 weight % of millet jelly, 0.26 weight % of ginseng extract, 0.15 weight % of 50 cubic mesh ginseng powder, and 0.12 weight % of licorice root powder into a mixer preheated at 65 degrees C and mixed them with 0.97 weight % of softener.

2. While maintaining the inside temperature of the mixer at no higher than 55°C, we combined 0.42 weight % of roast coffee for coffee flavor and 0.06 weight % of *l*-menthol for

menthol flavor as flavors with 2 weight % of mint flavor for improving the ginseng taste itself, and mixed the ingredients in the mixer for the chewing gum composition.

3. We arranged to have ten taste experts taste 3 grams of the chewing gum produced by the above-described process and conduct a study involving a comprehensive flavor comparison of the chewing gum as a consumer food item.

4. We classified flavors of the chewing gum from this case study into 5 levels, i.e., A, B, C, D, and E, and showed the results of the experts' evaluation in Table 2.

### Experiment 2

1. We put 21 weight % of gum base, a sweetener consisting of 68 weight % of sugar and 8 weight % of millet jelly; 0.46 weight % of ginseng extract, 0.35 weight % of 50 cubic mesh ginseng powder, 0.12 weight % of licorice powder with 1.09 weight % of softener into a mixer preheated at 65 degrees C and mixed them.

2. While keeping the inside temperature of the mixer at no higher than 55°C, we combined 0.92 weight % of roast coffee for coffee flavor and 0.06 weight % of *l*-menthol for menthol flavor and mixed them in the mixer for a chewing gum composition.

3. As described in experiment 1, we arranged to have official inspectors conduct a study involving a comprehensive flavor comparison of the chewing gum as a consumer food item and showed the results in Table 2.

### Experiment 3

1. We put 21 weight % of gum base, 68 weight % of sugar and 8.4 weight % of millet jelly as sweeteners, 0.52 weight % of ginseng extract, 0.40 weight % of 50 cubic mesh ginseng powder with 0.7 weight % of softener into a mixer preheated at 65°C and mixed them.

2. While maintaining the inside temperature of the mixer at no higher than 55°C, we added 0.92 weight % of roast coffee for coffee flavor and 0.06 weight % of *l*-menthol for menthol flavor and mixed in the mixer for a chewing gum composition.

3. As described in experiment 1, we arranged to have taste experts conduct a study involving a comprehensive flavor comparison of the chewing gum and showed the results in Table 2.

### Experiment 4

1. We put 21 weight % of gum base, 68 weight % of sugar and 8 weight % of millet jelly as sweeteners, 0.46 weight % of ginseng extract, 0.34 weight % of 50 cubic mesh ginseng powder, 0.46 weight % of instant coffee powder, 0.11 weight % of licorice with 0.60 weight % of softener into a mixer preheated at 65°C and mixed them.

2. While maintaining the inside temperature of the mixer at no higher than 55°C, we added 0.97 weight % of roast coffee for coffee flavor and 0.06 weight % of *l*-menthol for menthol flavor and mixed the ingredients in the mixer for a chewing gum composition.

3. As described in Experiment 1, we arranged to have taste experts conduct a study involving a comprehensive flavor comparison of the chewing gum and showed the results in Table 2.

### Experiment 5

1. We put 22 weight % of gum base, a sweetener consisting of 64 weight % of sugar and 6.92 weight % of millet jelly; 1.20 weight % of ginseng extract, 0.80 weight % of 50 cubic mesh ginseng powder, 2.0 weight % of instant coffee powder, 0.12 weight % of licorice with 0.7 weight % of softener into a mixer preheated at 65 degrees C and mixed these ingredients.
2. While maintaining the inside temperature of the mixer at no higher than 55°C, we added 2.0 weight % of roast coffee for coffee flavor, 0.14 weight % of *l*-menthol for menthol flavor, and 0.12 weight % of mint flavor and mixed in the mixer for a chewing gum composition.
3. As described in Experiment 1, we arranged to have taste experts conduct a study involving a comprehensive flavor comparison of the chewing gum and showed the results in Table 2.

Table 2

Level of flavor	Experiment 1	Experiment 2	Experiment 3	Experiment 4	Experiment 5
A	4	6	8	7	6
B	2	2	1	2	2
C	3	2	1	1	1
D	1	0	0	0	1
E	0	0	0	0	0

In Table 2, A indicates that the coffee flavors are strongly perceived in the first half of the gum chewing period while the ginseng flavors are very well perceived in the latter half of this period. B shows that coffee flavors are good at the beginning and ginseng flavors are good later; C indicates average; D is poor; and E is very poor.

In the Experiments 1-5 above, each composition is somewhat different. However, the gums were generally designed so that a strong flavor of coffee was perceived at the beginning and in the middle stage of chewing and a mixed flavor of coffee and ginseng in the latter stage of chewing.

That is, 0.41 weight % of a combined amount of ginseng extract and powder, 0.42 weight % roast coffee, and 0.12 weight % of mint flavor were used for Experiment 1, in which coffee and ginseng flavors are almost equally combined. In Experiment 2, coffee flavor was emphasized at the beginning of consumption by adding 0.81 weight % of ginseng extract and powder, and 0.92 weight % of roast coffee flavor.

In Experiment 3, the gum was designed so that a bitter ginseng flavor was perceived in the latter half of the chewing stage by adding larger quantities of ginseng extract and powder than in Experiment 2. In Experiment 4, the gum had stronger coffee flavor in the latter half of consumption by addition of the same amount of ginseng ingredients as in Experiments 2 and 3 and by enriching with instant coffee powder. In Experiment 5, the quantities of ginseng ingredients and coffee flavor were increased by about 2 weight %, and, at the same time, that of instant coffee powder was also increased by up to 2 weight %. The quality of the coffee-flavored ginseng chewing gum of this invention was comparatively analyzed in cases 1-5 above and summarized in Table 1. As a result, the chewing gum manufactured in Experiment 3 was found to be the product with the best quality.

### Claims

1. Coffee-flavored ginseng-containing gum characterized by a composition consisting of 20-22 weight % of ordinary gum base, 0.26-1.20 weight % of ginseng extract, 0.15-0.80 weight % of ginseng powder, 0.4-2.0 weight % of instant coffee powder, 64-68 weight % of sugar, 8-9 weight % of millet jelly, and, as flavors, 0.4-2.0 weight % of roast coffee flavor, 0.01-0.12 weight % of mint flavor, and 0.06-0.14 weight % of *l*-menthol.

2. Manufacturing process for coffee-flavored ginseng-containing chewing gum characterized by the fact that it includes (1) combining and mixing 20-22 weight % of the usual gum base, 64-68 weight % of sugar, 8-9 weight % of millet jelly, 0.26-1.2 weight % of ginseng extract, 0.15-0.80 weight % of ginseng powder, 0.4-2.0 weight % of instant coffee powder, and the usual sweeteners and softeners in a mixer preheated at 60-70°C and (2) adding 0.4-2.0 weight % of roast coffee flavor, 0.01-0.12 weight % of mint flavor, and 0.06-0.14 weight % of *l*-menthol to mixture (1) while maintaining the inside temperature of the mixer at no higher than 55°C.